

MINERALOGY.

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(Continued from p. 580.)

The uses of gypsum are various; in the Canaries it is used by way of remedy for their wine, and about Malaga a large quantity is tunned up with the juice of the grapes; this custom is most probably derived from the ancients, for we learn by different passages in the Greek writers on husbandry that it was used as a clarifier. They threw gypsum into their new wine, stirred it often around, then let it stand for some time, and when it had settled, poured off the clear liquor. It would appear, however, that gypsum caused the spirituous part to evaporate, that the wine acquired a certain sharpness which it afterwards lost, but the good effects of the gypsum were lasting. This custom is very little followed at the present day. It is sometimes found an admirable remedy for restoring beer when pricked. As a manure it is invaluable, and the most surprising evidences are given of its renovating and invigorating powers. It is found to answer best in sandy or gravelly soils. From 7,000 to 10,000 tons used to be shipped annually from Nova Scotia, in New York, Pennsylvania, and other parts of the United States; and, according to the reports given, its effects were wonderful, particularly on grass. The crops of corn and Indian corn were more than doubled by its use instead of stable manure. Its effects have been great when employed in the proportion of one bushel to the acre annually. It is, however, so varying in its nature, that great care should be taken in choosing it for agricultural purposes, being variably saturated with sulphuric acid, and sometimes containing metalline substances inimical to its use, either in manuring lands, or in refining wine or beer; for the two latter purposes in particular, when used, the greatest care ought to be taken to ascertain that it is a pure sulphate.

If chalk, marble, limestone, spar, or any other species of calcareous earth, containing fixed air, be exposed to continued ignition, they give out carbonic acid gas and water, in the amount of nearly one half of their weight. The remainder, consisting chiefly of lime, has a strong tendency to combination, and attracts water very powerfully. The addition of water to lime produces a very considerable heat, attended with noise and agitation of the parts, which break asunder, and a phosphoric light is seen if the experiment be made in the dark. Water dissolves about one seven-hundredth part of its weight of lime, and is then called lime-water. This solution has an acid taste, and turns syrup of violets to a green colour. If lime-water be exposed to the open air, the lime attracts carbonic acid gas, and is by that means converted into chalk; which, not being soluble in water, forms a crust on the surface, that, when of thickness, breaks and falls to the bottom, and in this way in time the whole of the lime will be separated.

Mortar has a degree of adhesion and ductility much less than clay. When dry, it is more or less friable, like chalk. A mixture of sand or broken earthen vessels greatly increases its firmness. If dry quick lime be mixed with mortar, it gradually absorbs the superfluous water, and the mass becomes solid in a very short time; this latter fact ought to be borne in mind by builders.

CALCAREOUS EARTH.—The vast importance of the earths in the harmony of nature, and the many difficulties placed in the way of truly comprehending their nature and the uses to which by nature as by art they are applied, lead me to give them more than an ordinary consideration, and to point out the absolute necessity which exists that the lover of science should begin by observation of vital phenomena.

Earths are defined as bodies simple, with respect to the present powers of chemical analysis, brittle, incombustible, infusible by the heat of furnaces, not soluble in many hundred times their weight of water, and destitute of that opaque brilliancy which characterizes metals; taken substantively, they are called silica, lime, clay, barytes, and magnesia, &c. Of these silica and lime take the precedence in the order of events manifest in the organic, fossil, and mineral kingdoms. From the earliest dawn of natural

philosophy up to the present epoch, fossil and mineral bodies, and stratified and amorphous masses, have been considered without reference to organic existences and vital phenomena; but, since geology has turned its attention to the phenomena of fossil and mineral beds, the close connection of organic and inorganic matter has been observed, a new field of observation has been opened to view, embracing the varied and eventful history of past ages, in which the remains of animals and vegetables, no longer existing on the earth, have united their aggregate remains to form hill and mountain masses, and many of the previously inexplicable phenomena of fossil and mineral bodies.

As animal and vegetable bodies are the primitive fountains from whence the earths are derived, and time and a perpetual succession of generations add to the quantities of those earths; so the earths in return become the source and origin of organic existences, the bases on which they exist, and the sources from whence they derive their varying capacities and powers; thus, by this reciprocity of action, a positive and continuous increase takes place generally and locally,—generally, as applied to the whole planetary body; locally, as measured out by periods of disturbance and repose, of generation and decay. The one general law governs the production of all the earths.

Vegetable mould is the product of decomposition of vegetable bodies; proofs of its origin are continually before our eyes, and are open to all men who choose to experiment thereon, or to watch the progress of forming earth on the rock or chiselled stone, as masses or lichens perpetuate their generations. It is a product peculiar to vegetables not to be imitated by art, nor yet to be distinctly understood by chemical analysis. Lime or animal earth is as distinctly marked in its origin as it is by its peculiar qualities; and as vegetable mould is characteristic of land vegetation and atmospheric and aqueous action, so lime is equally characteristic of oceanic animals, and of the vital processes by which it is elaborated: both are produced by the same laws, but by modified and variable action; both are subservient to the one great end, the increase of this planetary body, the difference being, the one is elaborated in the medium in which man, the intelligent power, is disposed, and therefore appeals directly to the cognizance of the senses; the other is disposed in a denser medium removed from immediate observation, and comes not therefore so directly within the scope of our discoveries.

That lime is elaborated by animals within the ocean is a fact admitted, and not in the least invalidated by the readily ascertainable circumstance, that it is also received into both animal and vegetable systems of *terra firma* by absorption from the soil; for as a constituent of the animal food: the lesser fact is demonstrable by experiment, and, being proved, is an admitted truth; but the greater fact is the gathering of observation as well as individual experiment, a truth of induction passing through a chain of reasoning which none but the philosophic observer can follow, and which, not being generally received, is still a disputed truth.

The reasons are here for believing that lime is elaborated by animals, as vegetable matter is elaborated by vegetables, are wise and powerful, although they may not be found convincing by men wedded to previous opinions. It is observed that as polypi, molluscs, and crustacea approach and are disposed within the broad tropical belt, so they secrete the greater abundance of lime; and as they advance towards the polar circle, so many species become partly or wholly divested of this earth. That stony coral formations are peculiar to the middle regions, and are governed in their increase of species and general quantities by latitude, dip, and inclination, and the absence of disturbing and destroying causes: that in tropical seas they cover areas of many thousand square miles, constituting hill and mountain chains and groups; whereas in temperate regions there are but few calcareous species, and within the polar seas none: that the whole bed of the ocean in these regions, independent of disturbing causes, is evenly composed of calcareous matter like a fine chalk generated by the digestive processes of the living occupants, or by the partial or entire decomposition of these various tribes, of hill and mountain chain, of coral rock building in every variety,

of mollusca, crustacea, and finny inhabitants of the deep; the whole being interspersed with beds of coral and other sand, and beds of animals and vegetables as in the earth on which we tread, whose allotted duties, in like manner, are to contribute in life and in death to the material on which they are disposed.

(To be continued.)

SOCIETY OF ARTS.

DECEMBER 11th.—W. Hughes Hughes, Esq., V.P. in the chair.

M. Lassus, architect to the French Government, was elected a corresponding member.

The Secretary read a paper "On Mr. J. P. Chatten's Improved Dead Eyes." A model and diagrams to illustrate which were placed before the meeting.

The next paper read by the secretary was "On the Kamptulicon Life-boat," by Lieut. G. Waller, R.N.

The third paper read was "On the Hydraulic Ram," by Mr. Freeman Roe; a model and diagram accompanying the communication.

Several specimens of the earthenware, and other manufactures of the Mexicans, were placed on the table and partly described by Dr. Thompson. This subject will be brought forward in a more interesting form after Christmas.

SOCIETY OF MASTER CARPENTERS.

On Wednesday evening last, a meeting of this society was held at the Freemasons' Tavern, Great Queen-street, Mr. Biere, the president, took the chair, and was supported by the vice-president, Mr. Sparks. The minutes of the previous evening having been read and confirmed, and the usual business of the society transacted, it was determined that a special general meeting be convened for the 23rd inst., for the purpose of taking into consideration a petition to Parliament to abolish the window-duties, or to so modify them as to lead to a better system of ventilation. Among the members present, were—Mr. Stevens, Mr. Higgs, Mr. W. Hutchins, Mr. Tuhitt, Mr. Burdall, Mr. Davey of Stanmore, Mr. Outhwaite, and Mr. Lover. From the great interest taken in the forthcoming question by the society, and by the trade generally, as well as by the public at large, a numerous attendance is expected next Monday week.

HEALTH OF TOWNS.

On Wednesday last a numerous and highly influential meeting took place at Exeter Hall, for the purpose of forming an association to promote legislative and other measures for the improvement of the health of towns. The Marquis of Normanby occupied the chair; and among those on the platform were the Earl of Shelburne; Sir R. B. Inglis, Bart.; Sir W. Clay, Bart.; Mr. Sheil, M.P.; Mr. Ewart, M.P.; Mr. Hawes, M.P.; Dr. Southwood Smith, &c. The meeting was addressed by the noble chairman at considerable length on the paramount importance of the objects they had in view, and the following resolutions were introduced by their respective proposers and seconders in neat and effective speeches:—

- 1st. That the want of proper sewerage, drainage, and cleansing of towns was the cause of sickness, suffering, and a high rate of mortality, as well as of the moral and physical deterioration of the people.
- 2nd. That an association be formed for the purpose of improving the condition of the dwellings of the poor in towns.
- 3rd. That a subscription be opened to carry out the objects of the proposed society.
- 4th. That the condition of burying-grounds be considered.

Dr. Southwood Smith then read a petition, which he had drawn up for the purpose of being presented to both Houses of Parliament. It set forth the present condition of the poor in respect of their dwellings, the various means by which they might be improved, and prayed for legislative interference. The presentation of the petition was entrusted to the Marquis of Normanby and Lord Ashley.